

ABSTRACT

This invention relates to a method and device for performing non-destructive measurements of residual stresses in an investigation area of an object based on use of optical holographic interferometry technique.

The holographic interferometer is divided into a holographic probe which contains means for illuminating the investigation area of the object by coherent light, collecting the coherent light that scatters off this investigation area and means for performing a non-destructive dislocation release pulse of the residual stresses in a small region of the investigation area by exposing the object to an electric high currency, and a holographic camera which contains means for formation, registration, and development of a hologram and for formation of an interferogram of the investigation area of the object. The object coherent light is sent from the light source to the probe by a single-mode light guidance cable, from the probe to the holographic camera by an other single-mode light guidance cable, and the reference coherent light from the light source to the holographic camera in a third single-mode light guidance cable. In this way, one is allowed to measure residual stresses on surfaces of an object with high curvatures, in hardly accessible places, and under many weather conditions by a simple hand-held manual positioning of the holographic probe during the measurements.